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Filter Based Multiplexer/Demultiplexer Component

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Abstract

A multiplexer/demultiplexer optical system component that is passively aligned upon assembly is disclosed. The optical system includes a lens block and a mirror-filter block. In some embodiments, optical filters are positioned and epoxyed to the mirror-filter block using a positioning tool. In some embodiments, optical filters are positioned and epoxyed on a support structure which has been etched to receive the optical filters. The mirror-filter block is a block having flat surfaces, one of which is a flat reflecting surface. The lens block is formed by injection molding and includes a barrel for holding and positioning an optical fiber, placement for a collimating lens, and placements for focusing lenses such that, when assembled, light incident on each of the focusing lenses propagates along the optical axis of the focusing lens. In some embodiments, the collimating lens and the focusing lenses are integrally formed with the lens block. In some embodiments, one or more of the collimating lens or focusing lenses are formed separately and inserted into holders integrally formed with the lens block to receive the lens. In some embodiments, the lens block includes a reflecting surfaces that directs light onto the focusing lenses. Assembly and alignment of the multiplexer/demultiplexer involves positioning a flat surface of the mirror-filter block against a receiving surface of the lens block with the filters between them and epoxying the components in place.

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